

# **Hazard Elimination Project Evaluation**

Project Log # 200502096

Hazard Elimination Project W-3608

**Evaluation of the Realignment of SR 1222 (Old Hargrave Road) to Intersect a Newly  
Constructed Business Center Entrance Road and the Realignment of Business I-85  
Southbound Linwood Exit Ramp, Davidson County**

Documents Prepared By:

Safety Evaluation Group  
Traffic Safety Systems Management Section  
Traffic Engineering and Safety Systems Branch  
North Carolina Department of Transportation

**Principal Investigator**

\_\_\_\_\_  
Carrie L. Simpson, EI

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2/1/2006  
Date

Traffic Safety Project Engineer

# ***Hazard Elimination Project Evaluation Documentation***

## **Subject Location**

Evaluation of Hazard Elimination Project W-3608 –  
SR 1222 (Hargrave Road-Old Hargrave Road) near the intersection with SR 3165 (Lexington Parkway) and Business I-85, in Davidson County

## **Introduction**

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naïve before and after analysis has been completed to measure the effectiveness of this hazard elimination project. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

## **Project Information and Background from the Project File Folder**

The safety countermeasure chosen for the subject location was to realign SR 1222 (Old Hargrave Road) to intersect the newly constructed Lexington Business Center entrance road, SR 3165 (Lexington Parkway). In addition, the Southbound I-85B / US 29-52-70 Exit Ramp at this location was realigned. The construction of this project began in April 1997 and was completed on September 26, 1997.

The initial crash analysis for this location was completed from April 1, 1994 through March 31, 1997 with a total of four reported crashes. The initial crash analysis included all crashes that occurred within 150 feet of the intersection of SR 1222 (Old Hargrave Road) at the Southbound I-85B / US 29-52-70 Exit Ramp. According to the initial crash analysis, there were three Left Turn, Different Roadway crashes and one Rear End crash, resulting in no injuries. Driver error was stated as the causal factor of the four crashes and no treatment was recommended. The estimated project cost was \$385,160, with a benefit-cost ratio of 0.01:1.

## **Naïve Before and After Analysis**

After reviewing the hazard elimination project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from April 1, 1997 through April 30, 1998. The before period consisted of reported crashes from April 1, 1990 through March 31, 1997 (7 Years) and the after period consisted of reported crashes from May 1, 1998 through April 30, 2005 (7 Years). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The before period treatment data consisted of all crashes:

- On SR 1222 from 150 feet south of the intersection with I85B / US 29-52-70 SB Entrance Ramp to approximately 400 feet east of the intersection with I85B / US 29-52-70 SB Exit Ramp, and
- On the I85B / US 29-52-70 SB Exit Ramp.

The after period treatment data consisted of all crashes:

- Within a 150 feet Y-line from the intersection of SR 1222 (Hargrave Road) and the I85B / US 29-52-70 SB Entrance and Exit Ramps;
- Within a 150 feet Y-line of the intersection of SR 3165 (Lexington Parkway) and SR 1222 (Old Hargrave Road);
- On SR 3165 (Lexington Parkway) that occurred between the two previous intersections;
- On SR 1222 (Old Hargrave Road) from the intersection with SR 3165 (Lexington Parkway) to approximately 1000 feet east of the intersection; and
- On the I85B / US 29-52-70 SB Exit Ramp.

Please see the attached *Location Map* and *Aerial Photos* for further detail. The following table depicts the Naïve Before and After Analysis for the Total Crashes at the treatment location.

Treatment Information

	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-)/ Percent Increase (+)</b>
Total Crashes	9	3	-66.7%
Total Severity Index	1.82	3.47	90.7%
Fatal Crashes	0	0	N/A
Non-Fatal Injury Crashes	1	1	0.0%
Total Injury Crashes	1	1	0.0%
Night Crashes	4	1	-75.0%
Wet Crashes	3	0	-100.0%
Volume	1700	2100	23.5%

The naïve before and after analysis at the treatment location resulted in a 66.7 percent decrease in Total Crashes and a 23.5 percent increase in Average Daily Traffic (ADT). Further investigation shows there was a 90.7 percent increase in the Severity Index for Total Crashes. The before period ADT year was 1993 and the after period ADT year was 2001.

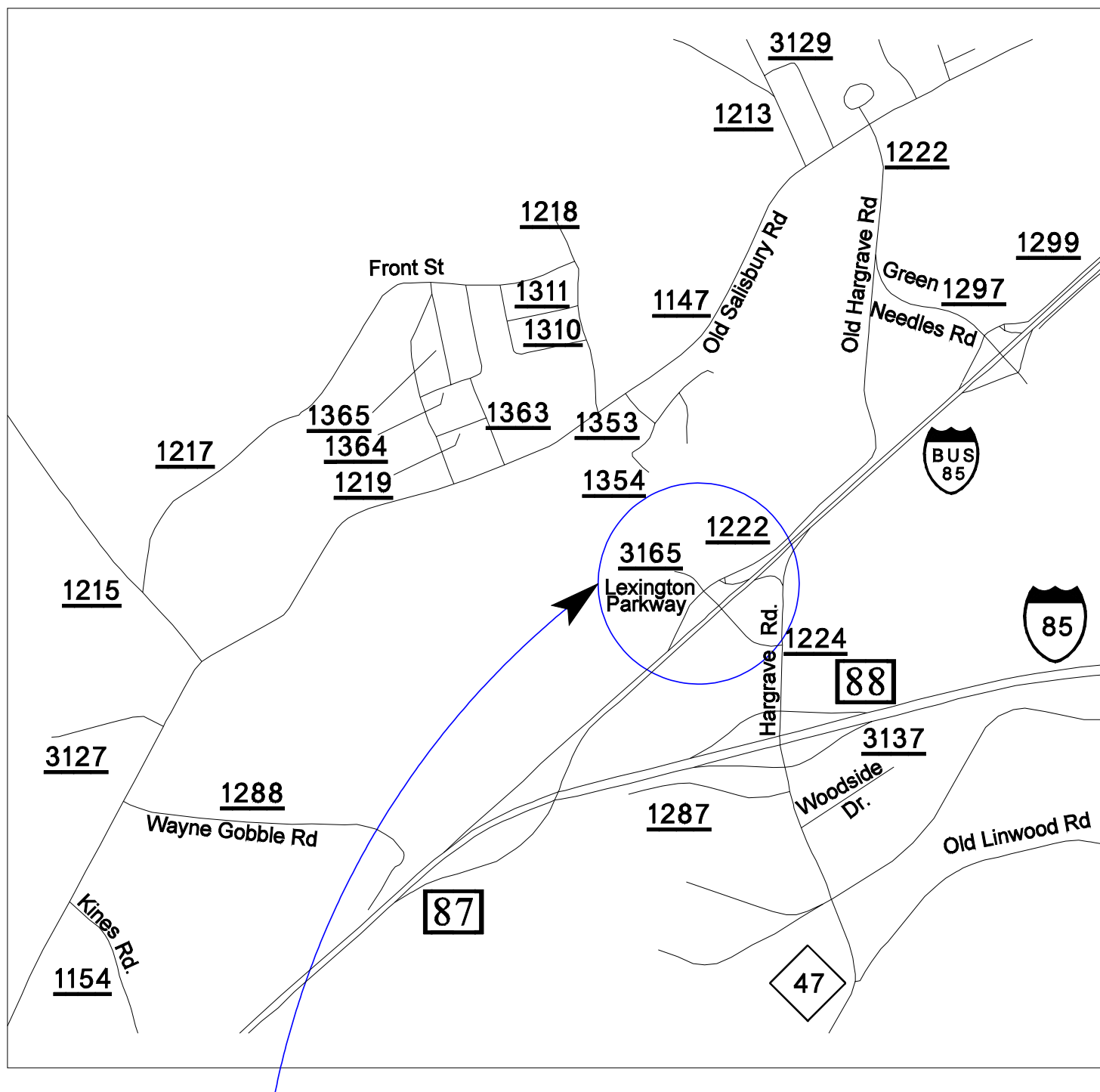
## **Results and Discussion**

The naïve before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 66.7 percent decrease in the number of Total Crashes and a 90.7 percent increase in the Severity Index for Total Crashes. The summary results above demonstrate that the Treatment Location appears to have had a decrease in the number of Total Crashes and an increase in the Severity Index from the before to the after period using naïve methodologies.

A review of the crashes at the treatment location reveals the following. The two crash types that occurred in the before period, Left-Turn, Different Roadway crashes and Rear End crashes, decreased from nine in the before period to none in the after period. In the after period, two Ran Off Road crashes occurred in the curve of the newly aligned SR 1222 (Old Hargrave Road). Curve warning signs with 25-mph advisory speed plaques are placed prior to the curve and chevrons are placed leading into the curve in both directions. One additional after period crash occurred at the 3-way stop controlled intersection of SR 1222 (Hargrave Road) and I85B / US 29-52-70 SB Ramps, a Left-Turn Same Roadway crash.

Please see the attached Treatment Site Photos. Photos are provided for all approaches of the treatment location. As the Safety Evaluation Group completes additional reviews for this type of countermeasure, we will be able to provide more objective and definite information regarding actual crash reduction factors.

Davidson County



Treatment Location: I-85 B / US 29-52-70 SB

*At Linwood Exit – Off Ramp*

## *Aerial Photos*



Before Period Aerial of Treatment Location



After Period Aerial of Treatment Location

*Treatment Site Photos (Taken on November 14, 2005)*



Driving south on I85B / US 29-52-70 at the Linwood Exit Off Ramp.



Driving south on the Linwood Exit Off Ramp.  
Notice the 25 mph Advisory Speed sign.



*Treatment Site Photos (Taken on November 14, 2005)*



Driving on the Linwood Exit Southbound Off Ramp.



Driving on the Linwood Exit Southbound Off Ramp at the intersection with SR 1222 (Hargrave Rd) and SR 3165 (Lexington Pkwy).



*Treatment Site Photos (Taken on November 14, 2005)*



Driving northwest on SR 1222 (Hargrave Rd) towards the Treatment Location.



Driving northwest on SR 1222 (Hargrave Rd) at the intersection with SR 3165 (Lexington Pkwy) and the I-85B Linwood Exit Ramps.

*Treatment Site Photos (Taken on November 14, 2005)*



Driving northwest on SR 3165 (Lexington Pkwy) at the intersection with  
SR 1222 (Old Hargrave Rd)



Driving southeast on SR 3165 (Lexington Pkwy) at the intersection with SR 1222 (Hargrave Rd)  
and the I-85B Linwood Exit Ramps.

*Treatment Site Photos (Taken on November 14, 2005)*



Driving south on SR 1222 (Old Hargrave Rd) at the starting point of the new alignment.  
The old alignment is shown above. Also notice the chevron leading into the curve.



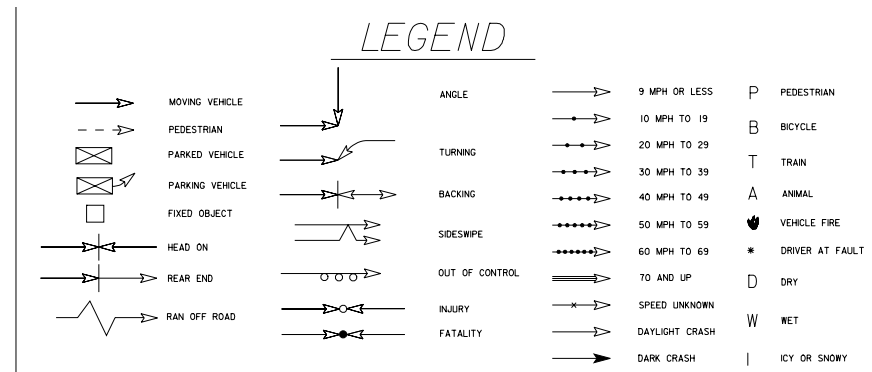
185B / US 29-52-70 SB Exit Ramp at  
SR 1222 (Hargrave Rd-Old Hargrave Rd) and  
SR 3165 (Lexington Pkwy)

DAVIDSON CO.

APRIL 1, 1990 - MARCH 31, 1997

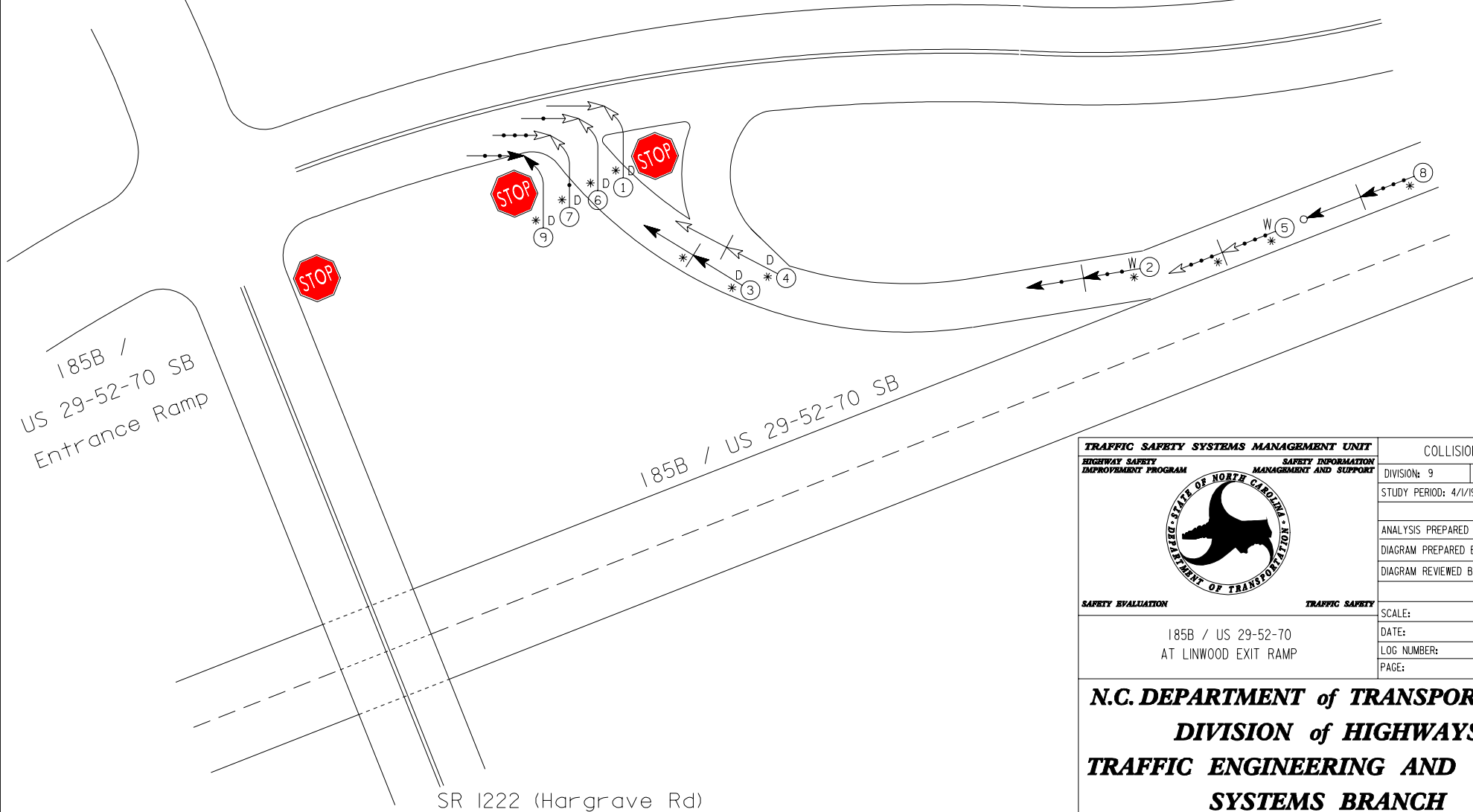
(7 YRS)

BEFORE PERIOD - TOTAL CRASHES



Construction Entrance  
to Business Park

SR 1222 (Old Hargrave Rd)



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
HIGHWAY SAFETY IMPROVEMENT PROGRAM	SAFETY INFORMATION MANAGEMENT AND SUPPORT	DIVISION: 9	REGION: TRIAD
		STUDY PERIOD: 4/1/1990 - 3/31/1997	
		ANALYSIS PREPARED BY: CLS	
		DIAGRAM PREPARED BY: CLS	
		DIAGRAM REVIEWED BY:	
SAFETY EVALUATION		TRAFFIC SAFETY	
185B / US 29-52-70 AT LINWOOD EXIT RAMP		SCALE:	NOT TO SCALE
		DATE:	12/21/2005
		LOG NUMBER:	200502096
		PAGE:	1 OF 1
<b>N.C. DEPARTMENT of TRANSPORTATION</b> <b>DIVISION of HIGHWAYS</b> <b>TRAFFIC ENGINEERING AND SAFETY</b> <b>SYSTEMS BRANCH</b>			



